

INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.
2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.
3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.
4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.
5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

**University
Microfilms
International**

300 N. Zeeb Road
Ann Arbor, MI 48106

1324697

WILSON, MARIE ELAINE

UNDERVALUATION OF EMPLOYEE FRINGE BENEFITS: A DECISIONAL
BIAS PERSPECTIVE

THE UNIVERSITY OF ARIZONA

M.S. 1984

University
Microfilms
International 300 N. Zeeb Road, Ann Arbor, MI 48106

UNDERVALUATION OF EMPLOYEE FRINGE BENEFITS:
A DECISIONAL BIAS PERSPECTIVE

by

Marie Elaine Wilson

A Thesis Submitted to the Faculty of the
DEPARTMENT OF MANAGEMENT AND POLICY
In Partial Fulfillment of the Requirements
For the Degree of
MASTER OF SCIENCE
WITH A MAJOR IN MANAGEMENT
In The Graduate College
THE UNIVERSITY OF ARIZONA

1 9 8 4

STATEMENT BY AUTHOR

This thesis has been submitted in partial fulfillment of requirements for an advanced degree at the University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this thesis are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the dean of the Graduate College when in his or her judgement the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED:

Marie Wilson

APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

..... Gregory B. Northcraft
G. B. NORTHCRAFT
Assistant Professor,
Management and Policy

12/2/84
Date

ACKNOWLEDGMENTS

The author would like to extend particular appreciation to Dr. Gregory B. Northcraft, the director of this thesis, and to Dr. Margaret A. Neale, both of the department of Management and Policy. Both faculty members have devoted considerable time and energy to the progress of this research and to many other areas of academic endeavor. Words cannot thank them enough for their friendship and guidance.

I must also extend my deepest thanks to my husband who has supported me , without complaint, during a rather extended course of graduate studies. Without his assistance I would never have attempted this degree program. I thank him for believing in me.

I am also indebted to other members of the faculty who have provided support, challenge and/or recommendations for ways in which this research might be improved, among them : Dr. Melanie Wallendorf, Dr. Richard Polley, Dr. Terrence Connolly and Dr. Gerrit Wolf. My thanks also to fellow students, Mark Sharfman and Jeanette Davy.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	v
LIST OF ILLUSTRATIONS.....	vi
ABSTRACT.....	vii
INTRODUCTION.....	1
METHOD.....	13
Research Site.....	13
Subjects.....	14
The Benefit Program.....	14
Procedures.....	15
RESULTS.....	20
DISCUSSION.....	27
REFERENCES.....	30

LIST OF TABLES

Table	Page
1. Actual and Estimated Benefit Costs By Group.....	22
2. Employee Estimates and Actual Contributions.....	23

LIST OF ILLUSTRATIONS

Figure	Page
1. Pattern of Mean Valuation and Actual Costs.....	25

ABSTRACT

One hundred and eighty two subjects voluntarily participated in a field study at the University of Arizona. This research documents the presence of an anchoring-and-adjustment process in the valuation of the fringe benefit of medical insurance. Further findings include a relative lack of employee knowledge regarding the employer cost or market value of such benefits, and significant undervaluation of the benefit by employees. These findings are consistent with the body of research into the heuristics and biases associated with human judgement and decision-making. Implications for practitioners and further research are discussed.

INTRODUCTION

Non-wage compensation, or "fringe benefits", have more than doubled as a percentage of total compensation since World War II (Lindsey, 1981). Non-wage compensation climbed to 37.1 percent of wages in 1980 ("Labor Letter", Wall Street Journal, Jan. 6, 1981). Fringe benefits are expected to reach forty percent of total compensation by the end of this decade (Mahoney, 1982; Frumkin & Wiatrowski, 1982). What has, in the past, been termed a "fringe" benefit is now a very significant and expensive component of the total compensation package. The value of such compensation to the employer, however, depends largely on employee perceptions of these benefits, as the value of providing such benefits is difficult to measure in any form other than the employee preferences (Mahoney, 1982) which determine employee valuations. Thus it seems important for research to address the process by which employees establish preferences for and assign values to the fringe benefits provided by their employers.

For the purposes of this paper, we will consider the value of a fringe benefit to be the value assigned to the benefit in excess of what the employee pays. This

difference is, of course, the amount by which the employee benefits, and is indirectly the measure of compensation effectiveness. If employers and employees are to receive the full advantage of compensation expenditures, employee perceptions of benefits received must meet or exceed payments for those benefits. That is, an employer who pays \$20 for an employee's benefit must expect to realize \$20 of compensation value. While such an employer might be pleased with an over-valuation of a benefit (e.g., an employee perceived value of \$25 for the \$20 spent), it is unlikely that they will be satisfied with \$5, \$10, or \$15 of employee-perceived compensation value when they have spent the \$20.

An actual employee evaluating benefits may be contrasted with an "objective" model of benefit value. The normatively appropriate way to value a fringe benefit would be to consider the market cost of the benefit (that is, the price of the good or service outside the employment situation) and the employee's marginal rate of income taxation (Steuerle, 1982). In addition, the employee might modify this value slightly by considering personal needs and preferences (Mahoney, 1982), as well as transaction costs. Mathematically this would be expressed as:

$$V = \frac{mc}{1-tm} (1+p)(1-tc) ,$$

where "V" is the value of the benefit derived by the employee, "mc" is the market cost, "tm" is the marginal rate of taxation and "p" and "tc" represent employee preferences and transaction costs, respectively. Market cost is generally considerably more than combined employee and employer contribution (due to group discounts afforded corporate purchasers) (Woodbury, 1983) and the tax savings divisor, $(1-tm)$ is less than one. Consequently the "objective" value of the benefit, $mc/(1-tm)$, will invariably exceed the market cost, which in turn exceeds the total cost (combined employer and employee payments). The transaction cost modifier is assumed to be greater than one when benefits are provided by the employer as this clearly reduces the transaction costs to the employee (e.g., seeking out alternatives, conducting an information search assessing costs and benefits). As this is a modifier, values for "tc" would demonstrate a very small decrement from 1. Although needs and preferences might possibly deflate the objective value of a benefit, these concerns should not overwhelm the tax and transaction savings and the relatively high cost of individual benefits in a market that favors group purchases. For purposes of analysis we might view "p" as having a possible range of values of +1

to -1 similar to concepts of valence in expectancy theory (Vroom and Deci, 1970).

For example, assume that an employee receives a benefit for which he pays \$1 per year. Further, let us assume that his employer pays \$49 per year and that the individual could purchase the same benefit for themselves, on the open market, for \$100. Let us further posit a marginal rate of income taxation of 50%, a preference or need for this benefit, and a savings of employee transaction costs by employer provision of this benefit such that "tc" equals virtually 0. In this instance;

$$V = \frac{\$100}{.50} (1.1)(1) = \$220$$

Clearly, this objective determination of benefit value is far in excess of the \$50 combined payment of employee and employer. This would suggest that benefits would be an inexpensive substitute for cash wages if employees valued these benefits "rationally". The flurry of recent attention by economists to substitutability of fringe benefits for wages in workers' preference patterns (Brown, 1980; Smith, 1979) supports the comparability of the two forms of compensation. This substitution of fringe benefit compensation for wages would be enormously useful for employers, if employees did value benefits as the

previous model suggests. In the example presented above, the employer realized \$220 of compensation "value" at a cost of \$50 (his/her cost directly in the form of payment to a provider, and through the deduction from a wage he/she also pays the employee).

Assuming that employers provide such benefits to attract and retain employees (Flipppo, 1984) as well as to motivate the employee in performance of his/her job (Huseman, Hatfield & Driver, 1978); such a high "return" for compensation expenditures would indeed be satisfying. Absent completely altruistic reasons for providing benefits, employers presumably expect a high employee valuation of benefits provided to justify the compensation cost. If employees do not value benefits highly, or value the benefits at least in excess of the total cost of the benefits, the employer in effect "loses" money. Dollars are being spent on employees and employers are not receiving commensurate compensation value in return.

Unfortunately, the wishes of compensation planners and employers notwithstanding, such consistently high employee valuation of benefits seems improbable. It is unlikely that employees may have ever considered their preferences for benefits or their marginal rate of income taxation (Steuerle, 1982); let alone integrated these concepts into a series of calculations which produces an

objective dollar value for a particular benefit. Employees may forget or ignore pertinent information about benefits (White & Becker, 1980); their calculational processes may be considerably less than optimal ; or such detailed consideration of a problem may be impractical.

If employees are unwilling or unable to engage in some sort of comprehensive rational process to value benefits, what alternatives to such processes may employees, in fact, use? It is possible that employees use a rule-of-thumb or other quick analytical process (Kahneman & Tversky, 1974) to evaluate benefits. Thus, while the objective formula for benefit valuation we have been considering would seem appropriate, it is unlikely that people go through such a process. While cognitive shortcuts (or "heuristics") through otherwise complex tasks may generally be adequate, essential differences in outcomes from what normative models would lead us to expect may result from these incomplete forms of estimation (Nisbett & Ross, 1980). If employee valuations do, indeed, depart from a "perfect" model, it behooves employers to investigate the extent and mechanism of such departures.

Departures from prescribed models by means of cognitive shortcuts, or heuristics, has fostered an expanding body of research (Slovic, Fischhoff &

Lichtenstein, 1977; Kahneman, Slovic & Tversky, 1983). This research has focused on several different cognitive techniques which may explain deviations from normative predictions. While several of these heuristics may have potential impact on compensation planning, the concept of "anchoring-and-adjustment" presents a particularly relevant candidate for influencing employee evaluation of benefits.

The psychological literature on "anchoring-and-adjustment" suggests that an arbitrarily chosen reference point will significantly bias subsequent estimates of value. Value estimates will be insufficiently adjusted away from the reference point toward the true value of the object of estimation (Slovic & Lichtenstein, 1971). In a demonstration of this effect Tversky and Kahneman (1974) had subjects estimate the percentage of African countries in the United Nations. The subjects were given a starting point (between 1 and 100) by the spinning of a "wheel of fortune". Subjects first had to decide whether their (random) number was higher or lower than the correct percentage, before giving their best estimate of the correct percentage. The median estimate for subjects whose starting point was 10 was 25%, while the median estimate for subjects whose starting point was 65 was 45%. Further, this anchoring of the estimate was not diminished when rewards were offered for accuracy.

Anchoring-and-adjustment may be particularly relevant in the context of employee evaluation of benefits. Employees are routinely presented with only one piece of information - their contribution (Huseman, Hatfield & Driver, 1978). This dollar value could serve as the starting point for value considerations similar to the above example. That is, employees may consider their own contribution, assess the total dollar value of the benefit as more or less than their cost and revise their estimate accordingly. As the keystone of the anchoring bias is insufficiency of subsequent adjustments, we would not expect employee estimates, "anchored" on employee contribution, to approximate a true value. Further, even though a more accurate and higher valuation might result in greater perceived compensation for the employee, research does not suggest that rewards, in general, improve estimator accuracy (Kahneman & Tversky, 1974).

Although the "wheel of fortune" example provided subjects with a completely non-diagnostic random number to influence decision-making, it is even more likely that less random values influence the decision making process in the environment of everyday decision-making. That is, a readily available value of some apparent (if misleading) diagnostic value may establish the basis for subsequent adjustment and estimation. In the previously considered

"objective" model, a hypothetical value of \$220 was established for a benefit with a market cost of \$100. The employer directly paid \$49 of this benefit's cost; the employee \$1. If the employee were to use any of these values (other than the "true" value) as a starting point for evaluation, what might their estimates look like?

Examples of anchoring-and-adjustment which have appeared in the literature (Kahneman & Tversky, 1974; Slovic & Lichtenstein, 1971) have documented an insufficient shift from an initial starting point toward a true value. As all of the possible anchors available to the employee are considerably less than the previously determined objective value, we would expect all adjustments in this context to be upward in direction. Thus, from whatever point employees begin their evaluative process, subsequent adjustments should enhance the benefit value. If employees use their own contribution as a starting point, we would expect them to adjust (however insufficiently) upward from \$1, in this instance. Thus, an employee's valuation of his or her benefit which anchored on the employee's contribution, with insufficient adjustment, could result in a perceived value of the benefit much less than employer expenditure. Clearly, a benefit valuation process using anchoring-and-adjustment may lead to significant departures from employer-desired

valuations, depending on the value of the anchor and the amount of subsequent adjustment.

Differences in information presentation and salience may account for the probable focus of an anchoring-and-adjustment process. Information on the market cost of benefits is not generally provided to the employee by the employer (Krogman, 1980). While the employee may have access to comparable information away from the workplace (i.e., previous experience, door-to-door salesmen or telephone solicitation, knowledge of the experience of others in attempting to obtain the benefit), such information may not be integrated with consideration of the specific benefit offered by the employer. Hence, while other comparable values may be relatively high, it is unlikely that any of these would come to mind as a starting point for estimation.

While the total cost - the combined contributions of employer and employee - is generally much less than the market cost (Steuerle, 1983), the employee's awareness of total cost may be no better than that of market value. Once again, employers do not routinely provide employees with information regarding total benefit expenditures (Krogman, 1980). These total costs, in terms of employer co-payment for benefits, are considerably greater, usually, than the employee contribution (Bureau of Labor Statistics,

1982). Information on these costs is provided, if at all, infrequently. Even if provided, this information may lack emotional or economic importance to the employee.

Research suggests that a direct out-of-pocket expense, especially from income which, in some sense, is already the employee's would be much more salient to the employee than an abstract third-party fund transfer - such as aggregate employer expenditure (Sellie, 1980). Further, information about employee contributions is generally available to the employee as a specific payroll deduction recorded on a paystub. Each time the employee is paid - weekly, bi-weekly or monthly - as well as times in between when the employee consults the paystub for whatever reason, they are exposed to information about benefit expenditures. Hence, employee contributions for benefits are relatively small, regularly presented, salient pieces of information which constitute a likely starting point for employee estimation of benefits.

Within the context of various levels of cost which might serve as an initial anchor, insufficiency of adjustment clearly leads us to expect that employee valuations of benefits would not rise to the level of a "true" or objective value. The potential for undervaluation may be much greater, however. Given the great discrepancies of dollar value (an order of magnitude

or more) which may exist between the employee contribution and total cost (employer plus employee costs) or market cost, we may posit that the insufficiency of adjustment from the very low initial value may lead to valuation which is substantially less than any desired valuation.

Consideration of possible cognitive biases on the part of employee valuations of benefits, the particular relevance of the anchoring bias to this context, and the probable use of employee contribution as a starting point for such a process, leads to the hypothesis:

Employee valuation of benefits will reflect an upward and insufficient adjustment from an initial "anchor" of employee cost for the benefit.

The assumption inherent in a focus upon employee cost as an anchoring value, is that employees are not aware of, or knowledgeable about, employer cost or market value. This assumption, as well as the preceding hypothesis, were tested in a field study.

METHOD

The hypothesis and assumption stated in the introduction were tested in a two-part field study. The first study focused on the extent and nature of benefit undervaluation, while the second study evaluated the process by which employees arrive at a value of their benefits.

Research Site

The University of Arizona provides a comprehensive benefit program of 30+ options to all full-time employees. At the time of hire, benefits are explained through presentations and brochures distributed by orientation personnel. After benefit selection employees are provided with a lengthy and detailed computer printout of their benefit information, including a summary of employer cost for all benefits. This summary sheet is updated for the employee and re-distributed each year. Bi-weekly paychecks include payroll deduction information on all benefit selections. Thus, employees are exposed to their cost for each benefit on a bi-weekly basis. In addition, employees are provided with information regarding employer cost for

benefits on a yearly basis. Employees are never provided by the University with information on market cost or with a simple index of total cost. That is, although employees are exposed to information about their own cost, as well as that of the employer, these two figures are never summed and presented to the employee in terms of total benefit cost.

Subjects

One hundred and eighty two employees at the University of Arizona, employed in or through the University Library and the Colleges of Education, Business and Public Administration and Law participated voluntarily as subjects. Length of employment ranged from less than one month to over thirty years, with a mean of 4.73 years. Respondents to the survey included 18 pay grades from Clerical 1 through Assistant Professor.

The Benefit Program

This research focused on valuation of medical insurance. There are six carriers and two types of coverage for the employee to select within the system studied. At the time of the study all but one of the subjects surveyed subscribed to one of three benefit plans; Equitable, Pima Care or CIGNA; with individual or family coverage. Equitable is a standard major medical insurance

plan, with a deductible for each insured person and 80% coverage thereafter up to a pre-set ceiling. Pima Care and CIGNA are health maintenance organizations (HMOs) with a set \$2-\$5 co-payment for any and all medical expenses. Employee membership among these plans is approximately equally divided. The one subject not subscribing to any of these three plans was deleted from the sample.

Procedures

In the both parts of this study, subjects answered one of two forms of a four page questionnaire about their fringe benefits. Questionnaires were distributed to all employees by departmental supervisors approximately midway between paydays. Both forms of the questionnaire elicited two types of information for analysis; (1) demographics, and (2) employee valuation of the medical insurance benefit. Additionally, the first version asked for employee estimates of employer cost and market cost, while the second requested details of the process used in determining a benefit value. Estimation of employee cost was not solicited in the first questionnaire because of the possibility of inducing an "artificial" anchoring effect, rather than documenting a "natural" anchor. Having documented a relationship in the first study, the second study focused on the nature of the decision process .

Solicited demographic information included years of University employment, years to planned retirement, pay grade, source of benefit information, number of dependents, marital status and coverage and carrier for medical insurance. In addition, information was collected about chronic or recent family illnesses and accidents.

To ascertain employee valuation of medical insurance, employees were asked to circle their preferences between certain amounts of cash per pay period, and lesser amounts of cash and their current medical insurance, per pay period. For example, respondents were asked to circle their preference between the following couplets, without regard for actual payroll amounts:

\$270 per pay period and OR \$300 per pay period
current medical insurance

\$245 per pay period OR \$205 per pay period
and current medical
insurance

\$145 per pay period OR \$100 per pay period
and current medical
insurance

\$620 per pay period and OR \$655 per pay period
current medical insurance

Twenty of these forced choice couplets were presented to the employee. The twenty couplets represented a progression in wage differential from zero to one hundred dollars in five dollar increments (e.g., \$5 difference, \$10 difference, etc.) The presentation order

of the couplets was randomized with regard to preference type (dollars or benefit), and pay level (i.e., \$100,200,300, etc. as wage base for differences between cash and benefit). This particular method of assessing employees' valuations of fringe benefits was chosen for several reasons: (1) in assessing a cash substitution value for benefits, we are really tapping employee preference structures (Mahoney, 1982). Preferences have often been approached in terms of utilities and modeled by successive choices between two options (i.e., is A preferred to B; is B preferred to C, and so on); and (2) in pilot studies, subjects had great difficulty in approaching an abstract concept of "worth" without concrete examples (in contrast, questions regarding employer or market costs involve issues of fact - i.e., how much does the employer pay for the benefit). Further, employees seemed unwilling (or unable) to generate a single, specific dollar value to replace what many regarded as the most important benefit they received.

The responses to these forced choice couplets were integrated across the twenty couplets to result in a five dollar range for each employee's cash substitution value for the benefit. For instance, if the employee had circled the left-most choice in the example presented above, we would be presented with a response pattern which could be

summarized to yield a five dollar range of indifference between cash and benefit for this respondent.

The first response represents a thirty dollar difference between the two cash values. As the employee prefers the benefit to an additional amount of cash, we may assume that the value of the benefit is greater than thirty dollars. Similarly, in the fourth couplet, the employee prefers the benefit to an additional sum of thirty-five dollars, thus, the value of the benefit is greater than thirty-five dollars. The opposite type of response pattern would be noted in couplets two and three, in which the employee prefers the additional cash amounts to the benefit. Hence, this employee's valuation of the benefit is less than forty dollars (the difference in couplet two) and less than forty-five dollars (the difference in couplet three). Integrating these inequalities across the four couplets for the value of the benefit (VB); $VB > 35$, $VB < 40$, and $VB < 45$; may be summarized as $35 < VB < 40$. This five dollar range should contain the employee's point of indifference between cash and benefit. Thus, the derived cash substitution value of this benefit for this particular employee would be between thirty five and forty dollars. As this study posited undervaluation, the higher number in this range was used as the more conservative index of the hypothesis.

The first form of the questionnaire (n=154) asked employees to estimate the amount their employer paid for the medical insurance benefit, as well as the amount which the employee would have to pay for the benefit if they were not employed by the University (market value).

In the second form of the questionnaire (n=28), employees were asked to indicate how much they would be willing to pay (per pay period) in order to retain their medical insurance. In addition, this sample was asked to detail how they had arrived at this dollar figure, that is, to provide a written protocol of their decision process. These protocols were blindly scored and summarized by three raters into type of process and information used. Cases of rater disagreement were deemed not in support of the hypothesis and are so reflected in the results. In addition, this sample was asked to report how much they paid for their medical insurance currently without reference to a pay stub or other source of information.

Employer cost and employee cost for each class of benefits was obtained from the University personnel office. Market cost was defined as the cost for conversion of benefits from employee to non-employee status for each carrier, as this represented the closest approximation of conditions and terms of coverage under the group plan.

RESULTS

The phenomenon under study is primarily one of over-reliance on an initial value with ensuing under-valuation because of insufficient adjustment. To test this hypothesized effect, it was appropriate to compare the employee valuation with other relevant costs (i.e., employee cost, total cost and market value); and to use regression analysis to assess the predictive efficacy of these costs. The distributions of responses across conditions was sufficiently normal and equal in variance to warrant the use of analysis of variance techniques.

The assumptions underlying the use of employee contribution as an anchor - that employer cost and market value are not known or understood - were supported by responses to the first questionnaire. Almost 40% of the respondents (63 out of 154) indicated directly that they did not know or could not estimate one or both of these values. Six respondents, approximately 4% of the sample, indicated that the employer contributed nothing (\$0) toward the cost of their medical benefit. The mean estimate of employer cost for those employees responding numerically was \$24.63 per pay period. This figure did not differ significantly across the six types of coverage,

despite great differences in actual employer expenditures (See Table 1). In reality, the average employer cost is \$50.15. The deviation of employee estimates of employer cost from actual employer cost is statistically significant ($t(99) = 13.36, p < .0005$).

The mean response for employee estimates of market value was \$28.86. This value is a significant departure from the actual average market value of approximately \$83 ($t(81) = 6.44, p < .0005$).

As responses to the second questionnaire demonstrated, employees were very aware of their own contribution toward the purchase of the medical insurance benefit. Mean estimates of employee contributions (see Table 2) do not differ significantly from actual employee costs ($t(23) = 0.81, p > .20$). Further, 32% of the sample (9 of 28) reported the amount of their contribution correctly to the penny. The difference between employee accuracy in estimating their own and other costs for the benefit serves to underscore the differential cognitive availability of this information to the employee.

Undervaluation, the product of a low initial anchor and subsequent insufficient adjust, is also supported by the data. As shown in Figure 1, employee valuations consistently fall short of the total cost of the benefit or its market value, and tremendously short

Table One. Actual and Estimated Benefit Costs By Group

Carrier/Coverage	Actual Cost	Estimated Value mean (sd)
PIMA/Ind'l	\$.66	\$ 22.10 (11.21)
CIGNA/Ind'l	.50	23.70(12.53)
Equitable/Ind'l	.50	22.00(10.53)
PIMA/Family	18.67	40.00(10.20)
CIGNA/Family	15.78	38.50(10.40)
Equitable/Family	30.72	70.60(12.70)

Carrier/ Coverage	Employer/Total Cost	Estimated Employer -mean	Market Cost	Estimated Market -mean
PIMA/Ind'l	\$33.95/34.61	\$22.14	\$55.00	\$44.40
CIGNA/Ind'l	32.87/33.37	23.45	50.00	32.36
Equit./Ind'l	34.40/34.90	23.33	78.00	33.54
PIMA/Fam'y	64.07/82.74	24.42	125.00	39.53
CIGNA/Fam'y	64.07/79.85	25.70	120.00	41.32
Equit./Fam'y	64.07/94.79	21.69	169.00	48.05

Table Two. Employee Estimates and Actual Contributions

Carrier/Coverage	Contribution Estimates (mean)	Actual Contribution (mean)
PIMA/Ind'l	\$.50	\$.50
CIGNA/Ind'l	.63	.66
Equitable/Ind'l	.55	.50
PIMA/Family	31.00	30.72
CIGNA/Family	18.92	18.67
Equitable/Family	16.35	15.78

of any objective or "true" value noted in the introduction (which would be even greater than both of the preceding values). Less than four percent of all the respondents (6 of 154) expressed a cash substitution value for the benefit which was greater than its actual total cost (employer plus employee costs). This departure of employee estimates from actual values is statistically significant ($t(154)=3.84, p <.0005$).

The central hypothesis of this study, that employees "anchor" their valuation on their own contribution toward payment for the benefit, is supported by the data collected in these studies in two ways. In the first study, the pattern of responses (as shown in Figure 1) most closely paralleled the levels of employee cost. The pattern of mean employee valuations is best approximated by the equation, value = employee cost + \$23. Regression of employee valuation of benefits on employee costs accounts for a relatively high proportion of variance ($r = .72$) while similar simple regressions on employer cost and market value account for much less ($r = .442$ and $.68$, respectively). Stepwise regression demonstrates that employer cost and market cost added little to the predictive strength of a model using only employee contribution (r^2 change = $.002$ and $.008$, respectively; $F(150,3)=1.2, .84; p >.5$). Responses to the second version

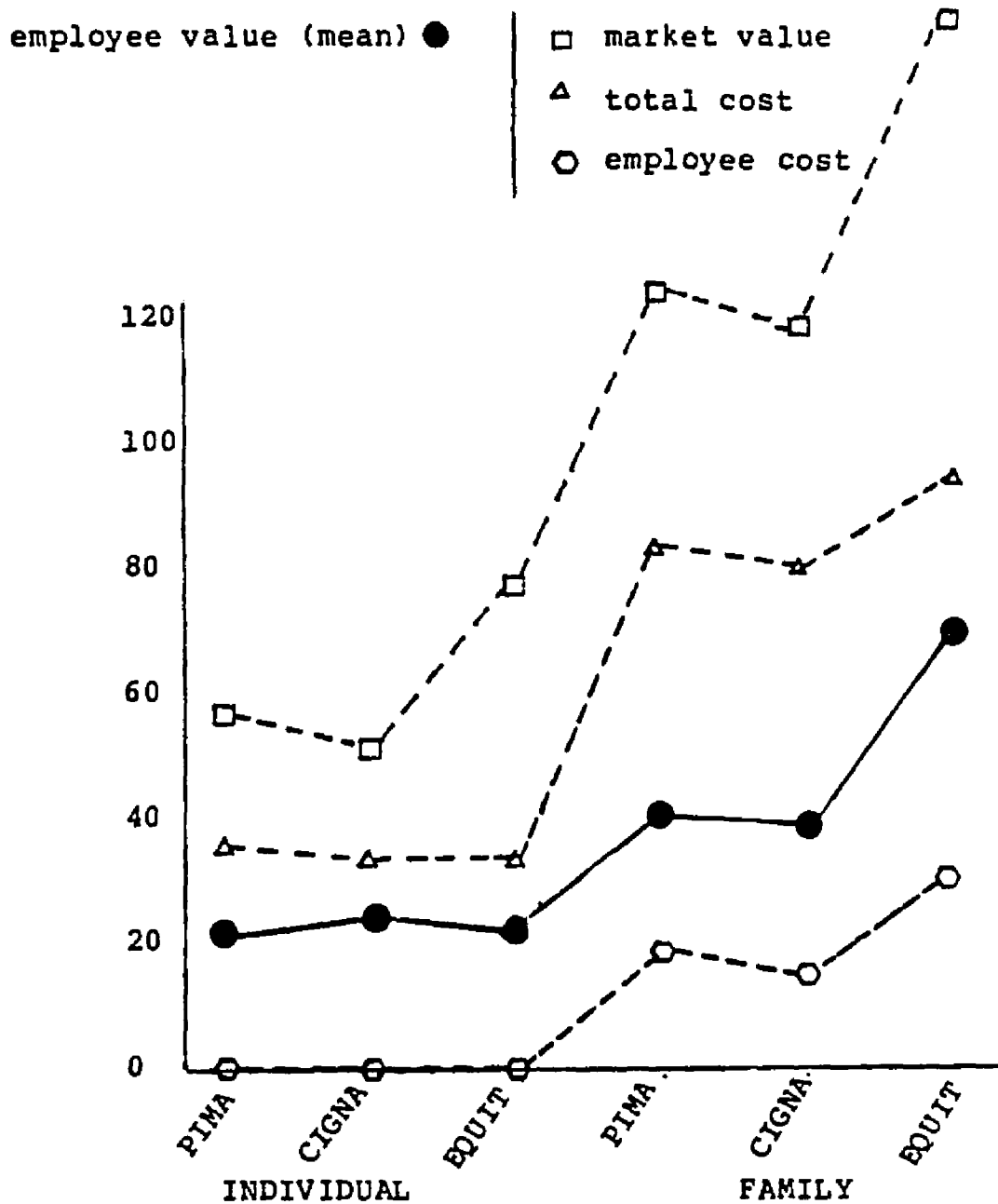


Figure One. Pattern of Mean Valuation and Actual Costs

of the questionnaire document the wide-spread use of an anchoring-and-adjustment process. Eighty-nine percent of the sample completing the second version of the questionnaire (25 of 28) indicated a calculational technique that would be characterized as anchoring-and-adjustment. Seventy-nine percent of the respondents to the second questionnaire (22 of 28) indicated that they used their own contribution as a starting point for estimation of value, while the remainder of subjects using an anchoring-and adjustment process, began the estimation from another pertinent starting point (such as the cost of adding a spouse or other dependent to their existing individual policy). Altogether these findings provide considerable direct and indirect evidence for the use of an anchoring-and-adjustment process by employees in the valuation of fringe benefits.

DISCUSSION

This study investigated the possibility of an anchoring-and-adjustment bias in employee valuation of benefits. In focusing on the medical insurance benefit, the results of this study indicate that employees have little knowledge of employer cost or market value for medical insurance. Employees are, however, quite aware of their own contribution towards the purchase of benefits and use this as an initial anchor to determine a value. The use of this anchoring and adjustment phenomena results in significant undervaluation of benefits when, as here, the employee contribution is quite low (both in the absolute and as a percentage of total cost).

Overall, the effect seems to be chronic undervaluation of benefits, biased towards employee cost. The result of this, of course, is that employers may not receive the full expected effect (in perceived value) of their fringe benefit expenditures.

Having isolated an anchoring-and-adjustment mechanism for fringe benefit valuation, an interesting arena for remediation/ manipulation is presented to the theorist and practitioner. There are at least two possible

approaches to an anchoring effect in this context: (1) enhance information - such as total cost - to serve as a more appropriate anchor; or (2) increase the cost of the anchor which appears to be most frequently in use - employee cost.

If an information - enhancement approach is adopted, employers would provide frequent information on a higher cost pattern for benefits - either total cost or market cost. It is almost inconceivable that an employee who was very aware that a benefit cost \$50 would value it as less. The paystub, or certain orientation procedures, may approach this process at its source - an informational deficit (Huseman, Hatfield & Driver, 1978; Krogman, 1980).

An easier, and economically more appealing approach, would be to raise the value of the anchor in use - employee contribution. In the simplest application of this approach, employers would raise the amount of employee contribution toward benefit costs. Using an anchoring and adjustment process, we would expect a higher initial "starting point" to result in a greater overall benefit valuation by the employee. If the savings realized from increased employee co-payment was re-directed into cash wages, the result might be a compensation package with enhanced value in both benefits and wage - for a nearly identical expenditure.

The best approach would probably be a combination of these two styles, which may best be incorporated into the newer "cafeteria" style benefit plans. These plans provide both an exposure to total costs for benefits as well as a possibility for higher employee co-payment. In addition, the plethora of choices and subsequent commitment to these choices (Staw, et al., 1976, 1981) may work in the employer's favor. If a variety of choices enhances benefit valuation, this has additional import for employers who provide a benefit "package" with few or no options. The program under study provides employees with many options and realizes substantial undervaluation. This effect may be even more egregious when choices are limited. Further research may well address whether cafeteria plans ameliorate employee undervaluation of benefits, and the impact of other choice structures on benefit valuation.

The most striking information in this study was the extent of benefit under-valuation. The employer in this study spends over \$25 million per year on employee benefits. If employees valued these benefits at 60% of the total cost, which is unlikely given these results, the employer would still "lose" over \$10 million each year in compensation value for the benefits provided. The sums expended and the extent of undervaluation serve to underscore the need for additional research in this area.

REFERENCES

- Brown, Charles. Equalizing differences in the labor market. Quarterly Journal of Economics. 1980, 94, 113-134.
- Flippo, E.B. Personnel Management. New York: McGraw Hill, Inc.: 1984.
- Frumkin, R. and Wiatrowski, W. BLS takes a new look at employee benefits. Monthly Labor Review. 1982, 105(8), 41-45.
- Huseman, Richard C., Hatfield, John D. and Driver, W. Getting your benefit program understood and appreciated. Personnel Journal. 1978, 57(10), 560-ff.
- Kahneman, D., Slovic, P. and Tversky, A. Judgement under Uncertainty: Heuristics and Biases. Cambridge, MA: Cambridge University Press, 1982.
- Kahneman, D. and Tversky, A. On the psychology of prediction. Psychological Review. 1974, 80, 237-274.
- Krogman, Roger. What employees need to know about benefit plans. The Personnel Administrator. 1980, 25(5), 48-ff.
- Lindsey, Fred D. Employee benefits, then and now. Nation's Business. August 1981, 62-63.

- Mahoney, T.A. Compensating for work. In Rowland, K.M. and Ferris, G.R. (eds.) Personnel Management. Boston, MA: Allyn Bacon, 1982.
- Nisbett, R.E. and Ross, L. Human Inference. New Jersey : Prentice-Hall, 1980.
- Sellie, C. Money talks - is anyone listening? Industrial Management. 1979, 21(6), 21-24.
- Slovic, P., Fischhoff, B. and Lichtenstein, S. Behavioral decision theory. Ann.Rev.Psychology. 1977, 28, 1-39.
- Smith, Robert S. Compensating wage differentials and public policy: a test for equalizing differences. Industrial and Labor Relations Review. April 1979, 32, 339-352.
- Staw, B.M. The escalation of commitment to a course of action.Academy of Management Review. 1981, 6, 577-587.
- Staw, B.M. and Ross, J. Commitment to a policy decision : a multi-theoretical perspective. Administrative Science Quarterly. 1978, 23 40-64.
- Steuerle, E. A primer on the efficient valuation of fringe benefits. OTA Papers. 1982, 51.
- Tversky, A. and Kahneman, D. Judgement under uncertainty. Science. 1974, 185,1124-1131.
- U.S. DEPARTMENT OF LABOR, Bureau of Labor Statistics. Employee compensation in the private non-farm economy. Bulletins 16-27, et seq. Washington, USGPO: 1982.

- Vroom, V.H. and Deci, E.L. An overview of work motivation. In V.H. Vroom and E.L. Deci (eds.) Management and Motivation. Baltimore: Penguin Press, 1970.
- White, William L. and Becker, James. Increasing the motivational impact of employee benefits. Personnel, 1980, 57(1), 32-37.
- Woodbury, Stephen A. Substitution between wage and non-wage benefits. The American Economic Review. 1983, 73(1) 166-181.